LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -A

WATERBODY MANAGEMENT PLAN SERIES

LAKE MARTIN

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

April 2012 - Prepared by
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LAKE HISTORY

GENERAL INFORMATION

Date reservoir formed

Lake Martin, also known as Lake La Pointe, is an 800 acre impoundment located five miles south of Breaux Bridge, Louisiana. Lake Martin was formed in 1952 by constructing a levee around an existing natural lake. Water enters the impoundment only by rainfall and when high water in the Ruth Canal overflows the levees. This shallow water-body encompasses approximately 800 acres with approximately 200 acres of open water area. The remaining area is composed of cypress-tupelo swamp with thick growths of black willow (*Salix nigra*) and buttonbush (*Cephalanthus occidentalis*).

Impoundment

Owners – Multiple owners:

- State of Louisiana - water bottom
- Nature Conservancy
- Approximately 100 private land owners

Purposes for creation – Recreational Activities (fishing, boating, site seeing). Act 337 of 1950 passed by the Louisiana Legislature created the St. Martin-Lafayette Game and Fish Commission.

Size

800 acres

Water shed

none

Pool stage

10.5’ above mean sea level (MSL)

Parish/s located

Located in west-central St. Martin Parish approximately five miles east of Lafayette, La. and five miles south of Breaux Bridge, LA. Road access is by the Lake Martin road from Hwy 31 to the east and from La. Hwy. 353 (Cypress Island Road) to the west. Lake Martin is situated at: Latitude: 30^0 12’ 18’’ N; and Longitude: 91^0 54’ 18’’ W.

Border waters

The Ruth Canal north of the lake provides water access to the levee from the Vermilion River.

Drawdown description
There is a 45-foot spillway with one gate used to conduct drawdowns.

Spillway length – 45 ft.
Gate size – 4 ft. x 4 ft. opening
Number of gates - 1
Condition – Good
Flow rate – gate fully opened can drop the lake 1 inch per day.
Sluiceway location – N/A
Sluiceway opening - N/A
Condition – N/A
Flow rate – N/A

Who controls
Louisiana Department of Wildlife & Fisheries

LAKE AUTHORITY

General Authority and Purpose

St. Martin-Lafayette Game and Fish Commission was created by Act 337 of the Louisiana Legislature in 1950. It was abolished by Statute 36:610 and the responsibility for management of the preserve was transferred to the Department of Wildlife & Fisheries.

Louisiana Department of Wildlife & Fisheries - Opelousas, LA (337) 948–0255

Lake Martin Advisory Council:
Theresa Privat – Chairman
Bob Thibodeaux – Vice Chairman
Mary Lynn Chauffe – Secretary
Norris Herbert – Treasurer
Ronnie Ann Garritt
Hubert Herbert
Ted Spillers
* The Advisory Council was abolished in 2001

Nature Conservancy – Breaux Bridge, La.
Ms. Katherine Kobrin

Approximately 25 private land owners

ACCESS

Map with locations of boat ramp (**Appendix I**).

Boat docks
1 boat ramp

Piers
None

SHORELINE DEVELOPMENT

State/National Parks
Louisiana Nature conservancy – south end of lake where the bird rookery exists.

Shoreline development by landowners
The Lake Martin shoreline is 26,800 feet in length of which approximately 15,000 feet has a two lane gravel road on the crown and is maintained by the St. Martin Parish Police Jury as a Parish road. There are four homes along this portion of levee and there is a short intersecting road with several homes. A double-wide concrete boat ramp and dock are located on the east levee.

PHYSICAL DESCRIPTION OF THE WATER BODY

Lake Martin was impounded in 1952 with the construction of a 26,800 foot ring levee around a low lying cypress swamp. The levee structural height is approximately 15 feet while the hydraulic height is approximately 12 feet. A 45 foot spillway is set at 10.5 feet MSL. This allows for approximately 4.5 feet of freeboard, but variations in levee height result in some areas exhibiting more freeboard, while others less. The levee encircles an area of approximately 800 acres. Most of this area, some 580 acres, is flooded timber which consists of bald cypress (*Taxodium distichum*), black willow (*Salix nigra*) and buttonbush (*Cephalanthus occidentalis*), with the remaining 200 acres being open water. The open water portion is about 5 feet deep along the tree line, then gradually deepening to about 8 feet toward the center. The flooded woods have water ranging in depth from a few inches to about 5 feet. There is a borrow canal around the inside periphery of the impoundment. This canal is very shallow in some areas, but up to 12 feet deep in others. There is a series of boat lanes through the flooded woods. These were cleared in the late 1970's and early 1980's. The boat lanes are about 4.5 feet deep. Also numerous stumps, logs and submerged vegetation make up the rest of the impoundments complex cover.

Shoreline length
5.1 miles of shoreline

Timber type
Bald Cypress (*Taxodium distichum*)/black willow (*Salix nigra*) /buttonbush (*Cephalanthus occidentalis*)

Average depth
4.5 feet

Maximum depth
12 feet

Natural seasonal water fluctuation
Water level fluctuation is typically about 1 foot.

EVENTS / PROBLEMS

Lake Martin was drawn down for extended periods of time beginning in the mid-1970's until 1981, due to the abundance of aquatic vegetation and flooding. A plan to renovate the impoundment was completed during this time. During these drawdown periods, boat lanes were cut through the timber on the northern and western portions of the impoundment and a central channel was dug to facilitate future drawdowns. The existing pump and drawdown structure were also refurbished during this time. In 1984, two culverts under the east and southeast levee were removed.

In 1993, the impoundment was drawn down approximately two feet, during which time 3,600 feet of the levee on the north and northwest sides were raised to a level equivalent to the lowest point along the Rookery Road section of the levee (southeastern). Additionally, a 45-foot wide spillway (set at a height of 10.5 feet MSL) was installed on the north levee to reduce hydraulic pressure along the low sections. Traffic gates were installed on the levee crown to prevent vehicular movement onto the unimproved section of levee.

Hydrilla (*Hydrilla verticillata*) was discovered in Lake Martin in 1996. Before the end of the first growing season, hydrilla had encompassed approximately 80% (640 acres) of the lake. In 1997 and 1998, herbicide applications, along with the stocking of triploid grass carp (TGC) each year, was implemented to combat the growth of hydrilla. The herbicide application was made by fixed winged aircraft operated by Aerial Crop Care based in Port Barre, La. The herbicide Aquathol®, was applied in liquid and granular form. A total of approximately 200 acres of submerged vegetation was treated each year. Two stockings totaling 4, 000 TGC were made during this same time period. By 1999, hydrilla reduction was becoming apparent especially in the center of the lake where it was most abundant.

Water quality in Lake Martin has suffered due to nitrogen inputs from the extensive bird rookery located on the south end of impoundment. The high nutrient levels have encouraged

excessive growth of aquatic vegetation, resulting in a depletion of oxygen during the decay process. In late 2001, a water control structure was put in place on the southeast end of the impoundment near the rookery. The idea behind the structure is to release the main pool of nutrients, into the adjacent 6,400 acre Bayou Tortue Swamp, largely owned by The Nature Conservancy. Here, the existing swamp vegetation will uptake and assimilate the nutrients.

With the new structure in place, partial drawdowns of 2 to3 feet were implemented from 2002 to 2006 to improve water quality conditions. Each year the structure was opened near the middle of September with full replacement of the water to be achieved no later than January 31st of the following year. To accomplish this, water was pumped in from the Ruth Canal, which skirts the north end of the impoundment.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Since impoundment, Lake Martin has had an overabundance of submerged aquatic vegetation. Main species include coontail (*Ceratophyllum demersum*), fanwort (*Cabomba caroliniana)*, American lotus (*Nelumbo lutea)*, and invasive species including water hyacinth (*Eichhornia crassipes*) and hydrilla (*Hydrilla verticillata).* Control efforts for water hyacinth include applications of the herbicide 2-4,D (dichlorophenoxy acetic acid). Aquathol (dipotassium salt of Endothall) was used for hydrilla control. Drawdowns are also used to control vegetative growth.

Type map

Aquatic vegetative type mapping has been conducted since 1985. Years in which sampling occurred include: 1986 to1996 and 2003 to 2005 (**APPENDIX II).**

Biomass

N/A

Treatment history by year available

Biological-

A total of 4,000 TGC have been stocked into Lake Martin to control the spread of hydrilla. In 1997 1,600 (2.5 fish/vegetated acre) were stocked, and in 1998 2,400 (3.75 fish/vegetated acre) more carp were stocked to reduce hydrilla production. The TGC have reduced hydrilla growth throughout the complex. Gill net samples taken in 2009 and 2012 have shown numerous TGC available in the lake weighing up to forty pounds.

Chemical-

Table 1 reports the herbicide applications that were used annually to control emergent and submergent vegetation including water hyacinth (*Eichhornia crassipes*), alligator weed (*Alternanthera philoxeroides*), pennywort (*Hydrocotyle spp*.), duckweed (*Lemna minor*), American lotus (*Nelumbo lutea*) and other emergent plants. In 1997 and 1998 hydrilla was treated by LDWF with Aquathol® and SONAR®.

Table 1. Herbicide applications employed to control nuisance aquatic vegetation on Lake Martin, Louisiana, from 1997 – 2009.

Lake Martin Herbicide Applications				
Year	**Gallons**	**Pounds**	**Acres**	**Vegetation**
1997	1,725	25,120	200	Hydrilla[Aquathol (Aerial application)]
1998		1,240	200	Hydrilla (Sonar Treatment (open water area))
2005	72		144	Hyacinth/Alligator weed/American Lotus
2006	102		179	hyacinth/duckweed/alligatorweed/pennywort/common salvinia
2007	119		188	hyacinth/American Lotus/Alligatorweed/frog's bit/pennywort/primrose/common salvinia
2008	196		337	hyacinth/American Lotus/duckweed/common salvinia/alligatorweed/frog's bit/pennywort
2009	68		123	Pennywort/primrose/common salvinia/hyacinth/alligator weed
2010	51		106	Hyacinth/Alligator weed/C. Salvinia/Frog's bit/Pennywort/Primrose
2011	103		160	Hyacinth/Alligatorweed/C. Salvinia/American Lotus/Pennywort/Primrose

HISTORY OF REGULATIONS

Recreational

Louisiana statewide recreational fishing regulations have been in effect for Lake Martin for all freshwater game fish species since creation of the impoindment.

Commercial

Lake Martin has been open to commercial fishing except during drawdowns, since creation of the impoundment. There has been very little commercial activity.

DRAWDOWN HISTORY

Lake Martin has historically had aquatic vegetation problems that have severely restricted boating and angler access. A drawdown was conducted in 1963 in an effort to combat the problem. This first drawdown was ineffective because water was unable to drain properly due to a poor drainage system. Other drawdowns were conducted, but with little success. In 1977, plans to alleviate these problems included construction of a drawdown structure, refurbishing the pump station and the dredging of a central drainage canal. These improvements were completed in 1981 with the refilling of the lake. However, vegetation problems developed once again reducing access and causing dissolved oxygen reductions and resultant fish die-offs. In 2001 another control structure was added on the southeast end of the lake near the bird rookery. The idea behind the structure was to release nutrients into the adjacent 6,400 acre Bayou Tortue Swamp. After construction, fall/winter drawdowns

began in 2002 – 2006 to improve water quality conditions.

Drawdown dates

There have been a total of 15 drawdowns (Table 2) for the control of submerged aquatic vegetation. Drawdowns were all conducted from September – December (Fall/Winter).

Table 2. Drawdown's conducted on Lake Martin, Louisiana by year from 1963 – 2008.

YEAR	PURPOSE	FISHING CLOSURE	DEPTH (ft)	% EXPOSED	FISH KILL
1963	Control of native submerged vegetation	No	2-3	25	No
1965	Control of native submerged vegetation	No	2-3	25	No
1968	Control of native submerged vegetation	No	2-3	25	No
1970	Control of native submerged vegetation	No	2-3	25	No
1972	Control of native submerged vegetation	No	2-3	25	No
1974	Control of native submerged vegetation	No	2	20	No
1977-1981	Spillway reconstruction	Yes	4-5	45	Yes
1984	Control of native submerged vegetation	No	3	30	No
1986	Control of native submerged vegetation	No	2-3	30	No
1993	Control of native submerged vegetation	No	2	20	No
2002	Improve water quality	No	2-3	30	No
2003	Improve water quality	No	2-3	30	No
2004	Improve water quality	No	2-3	30	No
2005	Improve water quality	No	2-3	30	No
2006	Improve water quality	No	2-3	30	No
2008	Build boardwalk in rookery	No	2-3	30	No

As shown in Table 2, drawdowns have been an important tool in managing aquatic vegetation in Lake Martin. From 1963 – 1986 native vegetation, such as coontail (*Ceratophyllum demersum*) and fanwort (*Cabomba caroliniana*), was the primary concern. In 1993, hydrilla was discovered in Lake Martin. In 1997 and 1998 herbicide applications and the stocking of TGC were used to control the spread of this invasive species. Lake Martin is an ideal location to implement TGC to remove/control submerged vegetation such

as hydrilla. The lake has a very limited watershed with little or no influence from outside water sources, which keeps the fish in the system. Therefore, these fish have remained since the initial stockings and continue to control submerged vegetative growth.

Who operates structures
Louisiana Department of Wildlife & Fisheries

FISH KILLS / DISEASE HISTORY

Fish kills occurred during the 1977 -1981 period when the control structure was under construction. This was due to low water levels and warm temperatures which created low dissolved oxygen conditions. From 1994 – 1996 a few fish kills occurred due to the abundance and decay of hydrilla and other submersed aquatics. In 2000 – 2003, nutrients originating from the large bird rookery on the south side of the impoundment also caused some fish kills due to poor water quality.

Largemouth bass virus
Not tested

CONTAMINANTS / POLLUTION

Water quality
Water quality parameters measured at the surface and near the bottom during each standardized sample include temperature, dissolved oxygen, pH, and conductivity.

The Louisiana Department of Environmental Quality (LDEQ) collects fish samples in waters throughout the state, in order to determine mercury concentrations in fish tissues. Samples were taken on Lake Martin in 2002. At this time there are no mercury advisories for fish from Lake Martin.
http://www.deq.louisiana.gov/portal/PROGRAMS/MercuryInitiative.aspx

BIOLOGICAL

Fish sampling history
From the 1960's through the early 1980's, biomass sampling (rotenone) was the preferred fish population sampling tool. From the mid- 1980's until present, other techniques including electrofishing, creel surveys, entanglement gear, biomass (rotenone), haul seines, and water quality sampling have provided necessary data related to managing Lake Martin fisheries populations.

Note: All standardized sampling data collected by the Inland Fisheries Section from 1965 through present are computerized. Any data prior to 1965 that may exist in the form of paper

documents or reports are filed in the LDWF District 6 Office in Opelousas.

Gear

Biomass (rotenone) samples consist of three to four, one-acre block-off net samples taken between the months of May through September. There were only two years, 1963 and 1974, in which biomass sampling was conducted on Lake Martin (Table 3). The average of two-one acre biomass samples in 1963 consisted of a total standing crop/acre of 195.0 lbs. The total standing crop/acre in 1974 was 142.2 lbs. In 1963 non-predatory species (buffalo and carp), made up the bulk of fish captured, but in 1974 game species (bass, crappie and bream), made up most of the total pounds sampled. Biomass sampling remains an important management tool, but is used less frequently. Since 1974, other sampling techniques, including electrofishing, creel surveys, gill nets and haul seines have been utilized to assess fish populations (Table 4).

Table 3. Lake Martin, LA biomass sampling (rotenone) results in total pounds of predatory and non-predatory fish per acre for 1963 and 1974.

	Lake Martin Rotenone Sampling		
Year	**Predatory Fish**	**Non-Predatory Fish**	**Total Lbs./Acre**
1963	160	13	195
1974	56	85	142.2

- Predatory Fish consist of: Gar, Carp, Bowfin and Buffalo
- Non-Predatory Fish consist of: Largemouth bass, Crappie and Bream

Table 4. Sampling gear employed to sample fish populations in Lake Martin, Louisiana from 1963 – 2010.

Lake Martin Fisheries Sampling	
Year	**Sampling Method**
1963	Rotenone
1966	Gill Nets
1974	Rotenone
1976	Gill Nets
1982	Gill Nets
1984	Gill Nets
1990	Electrofish, seine, gill nets
1997	Electrofish
1998	Electrofish
1999	Electrofish, gill nets
2000	Electrofish
2001	Electrofish, seine
2002	Electrofish, gill nets
2003	Electrofish, hoop nets

2004	Electrofish
2006	Electrofish
2007	Seine, creel survey, gill nets
2009	Electrofish, gill nets
2010	Seine
2011	Electrofish
2012	No samples
2013	Electrofish, lead nets, water quality, type map

Electrofishing equipment along with other sampling gear such as seines and gill nets, allow biologists to understand and evaluate fish populations and return many fish to the water alive. Rotenone sampling, does not allow the return of live fish to the water.

Lake records

Based on informal records maintained by LDWF fisheries biologists, the largest bass caught in Lake Martin was in 2004 and weighed 9.1 pounds.

Stocking history

The total number by species of fish stocked into Lake Martin, Louisiana from 1988 – 2006 is presented in Table 5.

Table **5**. Fish stocking history of Lake Martin, LA, from 1983-2010.

YEAR	FLORIDA BASS	CHANNEL CATFISH	BLUE CATFISH	NATIVE LARGEMOUTH BASS	BLACK CRAPPIE	TRIPLOID GRASS CARP
1983		5,300	400	60,000	20,000	
1990		18,750		14,400		
*1995	20,000					
1997						1,600
1998						2,400
2000	14,607					
2001	8,016					
2002		7,995				
2004		4,506				
2007	8,234	8,769				
2010	3.898					
Totals	**54,755**	**45,320**	**400**	**74,400**	**20,000**	**4,000**

All largemouth bass were stocked as fingerlings, ranging from 1- 2 inches in total length. Fingerlings were released by boat throughout the lake into suitable habitat, such as thick vegetation, button bush, fallen timber, etc…Other species stocked included channel and blue cat, black crappie and triploid grass carp. Also, in 1995 the JP Oil Company purchased Florida largemouth bass fingerlings for mitigation as per requirements of the Department of Environmental Quality. The Louisiana Department of Wildlife & Fisheries stocked these fish.

Species profile

Table 6. List of fish species collected by LDWF or are known to occur in Lake Martin, Louisiana.

Lamprey Family, PETROMYZONTIDAE
- Southern brook lamprey, *Ichthyomyzon gagei* Hubbs and Trautman

Garfish Family, LEPISOSTEIDAE
- Spotted gar, *Lepisosteus oculatus* (Winchell)

Bowfin Family, AMIIDAE
- Bowfin, *Amia calva* Linnaeus

Freshwater Eel Family, ANGUILLIDAE
- American eel, *Anguilla rostrata* (Lesueur)

Herring Family, CLUPEIDAE
- Gizzard shad, *Dorosoma cepedianum* (Lesueur)
- Threadfin shad, *Dorosoma petenense* (Günther)

Minnow Family, CYPRINIDAE
- Common Carp, *Cyprinus carpio* Linnaeus
- Cypress minnow, *Hybognathus hayi* Jordan
- Weed shiner, *Notropis texanus* (Girard)
- Pugnose minnow, *Opsopoeodus emiliae* Hay
- Bullhead minnow, *Pimephales vigilax* (Baird and Girard)
- Triploid Grass carp, *Ctenopharyngodon idella* (Valenciennes)

Sucker Family, CATOSTOMIDAE
- Smallmouth buffalo, *Ictiobus bubalus* (Rafinesque)

Freshwater Catfish Family, ICTALURIDAE
- Black bullhead, *Ameiurus melas* (Rafinesque)
- Yellow bullhead, *Ameiurus natalis* (Lesueur)
- Channel catfish, *Ictalurus punctatus* (Rafinesque)
- Blue catfish, *Ictalurus furcatus, (Lesueur)*
- Black madtom, *Noturus funebris* (Gilbert and Swain)
- Tadpole madtom, *Noturus gyrinus* (Mitchill)

Pirate Perch Family, APHREDODERIDAE
- Pirate perch, *Aphredoderus sayanus* (Gilliams)

Killifish Family, CYPRINODONTIDAE
- Golden topminnow, *Fundulus chrysotus* (Günther)
- Blackstripe topminnow, *Fundulus notatus* (Rafinesque)
- Blackspotted topminnow, *Fundulus olivaceus* (Storer)

Livebearer Family, POECILIIDAE
- Western mosquitofish, *Gambusia affinis* (Baird and Girard)
- Least killifish, *Heterandria formosa* Agassiz
- Sailfin molly, *Poecilia latipinna* (Lesueur)

Silverside Family, ATHERINIDAE
- Brook silverside, *Labidesthes sicculus* (Cope)

Sunfish Family, CENTRARCHIDAE
- Banded pygmy sunfish, *Elassoma zonatum* Jordan
- Green sunfish, *Lepomis cyanellus* Rafinesque
- Warmouth, *Lepomis gulosus* (Cuvier)
- Orangespotted sunfish, *Lepomis humilis* (Girard)
- Bluegill, *Lepomis macrochirus* (Rafinesque)
- Dollar sunfish, *Lepomis marginatus* (Holbrook)
- Longear sunfish, *Lepomis megalotis* (Rafinesque)
- Redear sunfish, *Lepomis microlophus* (Günther)
- Spotted sunfish, *Lepomis miniatus* (Valenciennes)
- Bantam sunfish, *Lepomis symmetricus* Forbes
- Florida largemouth bass, *Micropterus floridanus*
- Northern largemouth bass, *Micropterus salmoides* (Lacépède)
- White crappie, *Pomoxis annularis* Rafinesque
- Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Perch Family, PERCIDAE
- Creole darter, *Etheostoma collettei* Birdsong and Knapp
- Swamp darter, *Etheostoma fusiforme* (Girard)
- Slough darter, *Etheostoma gracile* (Girard)
- Cypress darter, *Etheostoma proeliare* (Hay)
- Logperch, *Percina caprodes* (Rafinesque)

Drum Family, SCIAENIDAE
- Freshwater drum, *Aplodinotus grunniens* Rafinesque

Nomenclature and phylogenetic order follows Nelson, *et al*. 2004. Common and Scientific Names of Fishes from the United States, Canada, and Mexico, 6th Edition. American Fisheries Society Special Publication 29. 386 pp. Exceptions are noted.

Genetics

Largemouth bass are collected during fall standardized electrofishing samples. Otoliths and livers are removed for age/growth and genetic analysis. Otoliths are sent to the age and growth laboratory at LDWF Baton Rouge headquarters and livers are sent to LSU for electrophoresis analysis.

Table 7. Observed Florida genome influence on Lake Martin, LA largemouth bass populations during 2006 and 2009.

Year	N	Northern	Florida	Hybrid	Florida Influence
2006	28	82%	7%	11%	18%
2009	32	84%	3%	13%	16%
Values expressed as percent of sample by number					

Threatened/endangered/exotic species

No T&E or endangered species documented in Lake Martin to date.

Creel

Historic information:

Only one creel survey has been conducted on Lake Martin.. The survey method used was a dockside (access point) survey of completed fishing trips. Fishermen targeted and harvested bluegill (66%) and bream (13%) species in good numbers during 2007. Other species targeted were largemouth bass and black crappie (Table 8).

Table 8. Creel survey estimates in percent by number of total fish species harvested from Lake Martin, LA by fishermen in 2007.

Lake Martin Creel Survey 2007

Species	% of Estimated Fish Harvested	Estimate of Total Fish Harvested
LMB	6%	140
Black Crappie	8%	202
White Crappie	0.5%	13
White Bass	0.1%	2
Yellow Bass	0.1%	4
Bluegill	66%	1,655
Redear Sunfish	3%	66
Longear sunfish	0.1%	2
Orangespotted sunfish	0.2%	5
Warmouth	3%	83
Bream spp.	13%	323
Totals	100%	2,495

HYDROLOGICAL CHANGES

Lake Martin was formed in 1952 by constructing a levee around a natural existing lake. Water enters the lake naturally only by rainfall and when high water in the Ruth Canal overflows the levees. In 1977, a new drawdown structure was installed, the pump station refurbished, and a central drainage canal dredged to improved drawdown capability to combat aquatic vegetation. These improvements were completed in 1981 and the lake refilled. However, vegetation problems developed a year later again reducing access and causing low dissolved oxygen conditions and resultant fish die-offs. In 2001, another control structure was constructed on the southeast end of the lake where the rookery exists.

Water use

Fishing and duck hunting

APPENDIX I.

Map of Lake Martin depicting water control structures, pumping station, spillway and Boat Ramp.

APPENDIX II –

AQUATIC VEGETATION TYPEMAPS AND NARRATIVES

Lake Martin

September, 1986

Charles N. Dugas

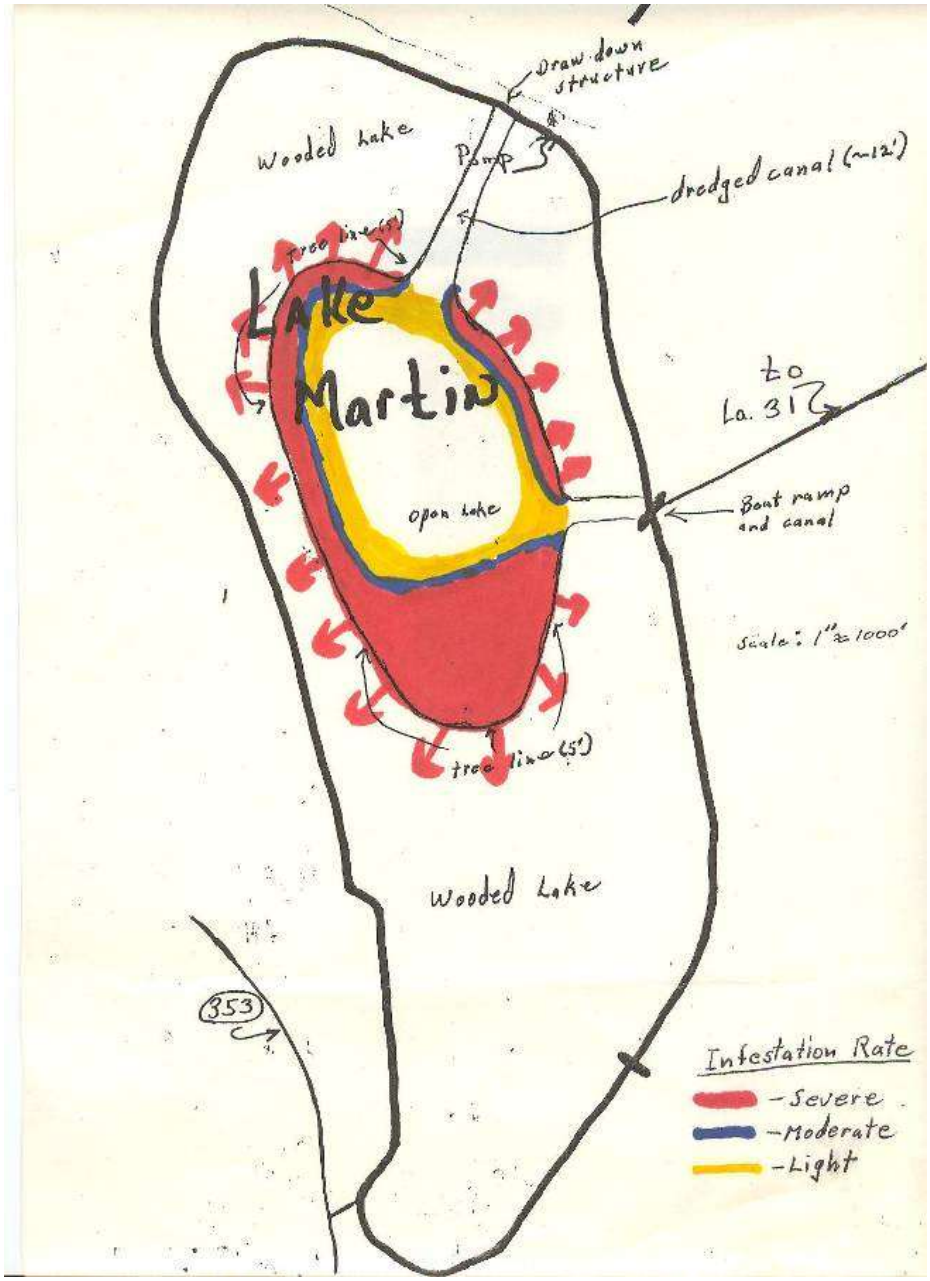
Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on September 15, 1986.

Coontail, Ceratophyllum demersum, was the dominant submersed vegetation encountered in Lake Martin. The infestation rate was severe in all water 5 feet or less in depth. There were moderate growths of fanwort (Cabomba caroliniana) and bladderwort (Utricularia sp.) mixed with the coontail.

Frog's bit (Limnobium spongia) was more plentiful than in the previous year. The infestation extended throughout the flooded woods and canals along the shoreline.

Although the south end of the lake was more severely infested with submersed vegetation than in the previous year, the overall rate of infestation seemed less severe. Especially at the north end where the area of vegetation - free water was noticeably larger.

The weather on the day of the survey was clear and hot with a light breeze. The lake water was moderately turbid.


Draw-down structure
Wooded Lake
Pump
dredged canal (~12')
Lake Martin
to La. 31
open lake
Boat ramp and canal
Scale: 1" = 1000'
tree line (5')
Wooded Lake
353
Infestation Rate
- Severe
- Moderate
- Light

LAKE MARTIN

September, 1987

Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on September 25, 1987.

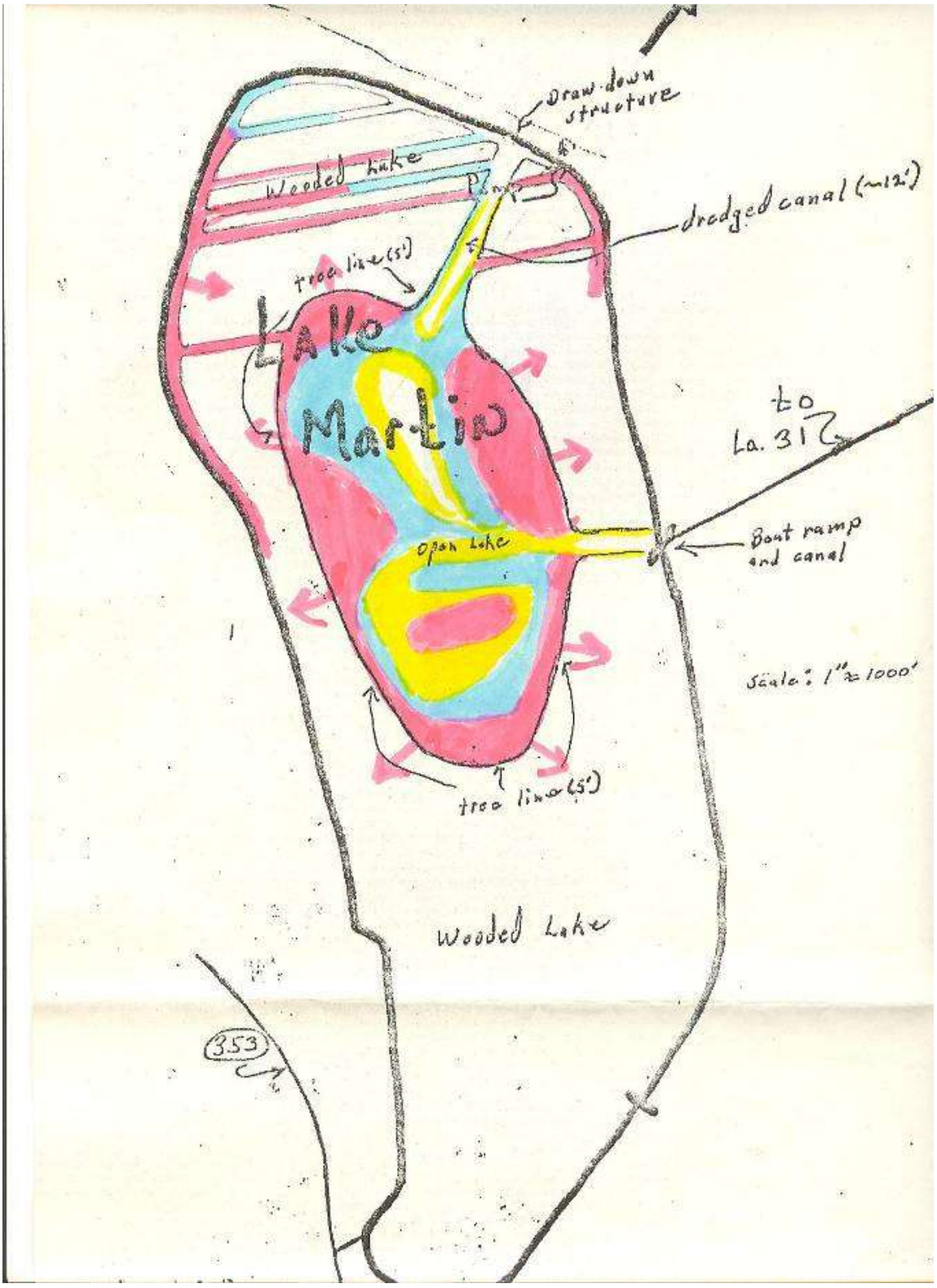
Coontail, Ceretephyllum demersum, was the dominant plant encountered from the flooded woods to the 6-foot contour in the open water lake. The infestation rate was severe to moderate in water 6 feet or less and light in deeper water. There were severe to moderate infestations of fanwort, Cabomba caroliniana, in depths 6 feet to 7 feet and light infestations from 7 to 8 feet. Water greater than 8 feet deep was relatively free of vegetation. There were scattered patches of bladderwort, Utricularia sp., throughout the lake.

Duckweed, Lemna minor, was present in the woods and in 50% of the open lake. The infestation rate was severe in most areas. Water fern, Azolla sp., was mixed with the duckweed in light rates.

Frogbit, Limnobium spongia, and alligator weed, Alternanthera philoxeroides, formed dense mats in the woods and most of the boat lanes through the woods. Water hyacinth, Eichhornia crassipes, was also present in the woods.

The lake had less surface area that was free of vegetation than in previous years. The infestation rate towards the center of the lake has increased although the south end is much less severe.

The weather on the day of the survey was clear and warm (86 degrees Fahrenheit) with a light breeze. The water temperature was 82 degrees Fahrenheit and the water was clear to lightly turbid (secchi-3'). The water level was at 10 feet MSL.


Draw-down structure
Wooded lake
Pump
dredged canal (~12')
tree line (5')
Lake Martin
to La. 317
open Lake
Boat ramp and canal
Scale: 1" = 1000'
tree line (5')
Wooded Lake
353

Lake Martin

September, 1988

Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on September 29, 1988.

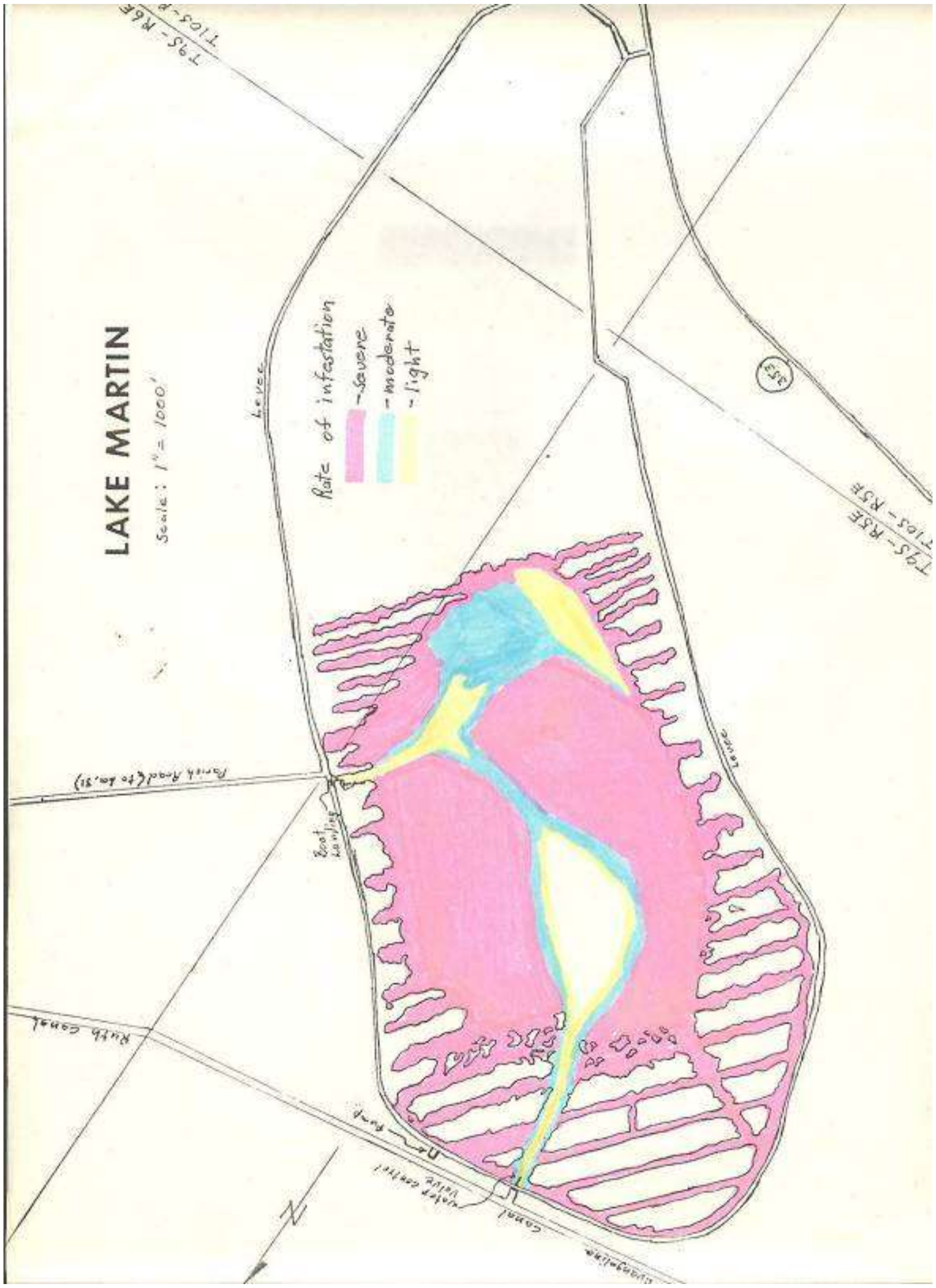
Coontail, Ceratophyllum demersum, and fanwort, Cabomba caroliniana, were the dominant submersed plants found in Lake Martin. The infestation rate was severe in most water less than seven (7) feet deep. However, some areas of the lake, most notably the southern end, that were 5-6 feet deep had only light to moderate infestations. Bladderwort, Utricularia sp., was mixed with the coontail and bladderwort.

Duckweed, Lemna minor, covered about 75% of the lake. The infestation rate was severe. Water-meal, Wolffia sp., was present in light infestations.

Frogbit, Limnobium spongia, and water hyacinth, Eichhornia crassipes, were much less abundant than in the previous years. These plants were found mostly in the flooded woods.

It was difficult to characterize the weed infestation according to depth contour. Some relatively shallow areas had light to moderate infestation while deeper areas had severe infestations. A small area in the center of the lake was relatively free of vegetation. This area was approximately seven (7) feet deep. Adjacent areas of the same depth were severely infested. Apparently, depth is not the only factor determining the distribution of submersed aquatic plants in this lake.

The weather on the day of the survey was clear, warm and calm. The water was clear to lightly turbis (secchi - 29"). The water level was at 9.75 feet MSL.



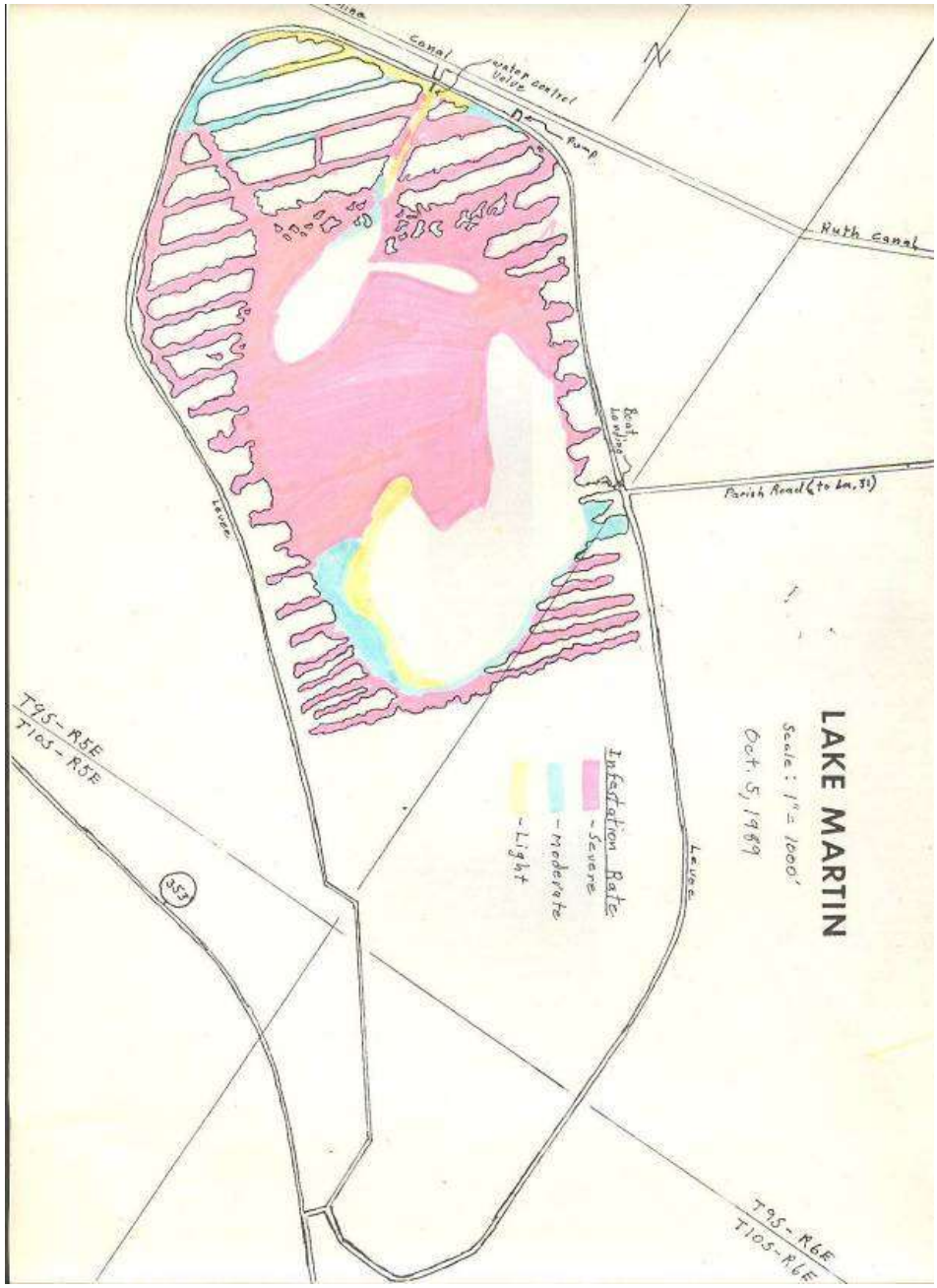
LAKE MARTIN
Scale: 1" = 1000'
Rate of infestation
-severe
-moderate
-light
Levee
Parish Road (to La. 31)
Boat landing
Ruth canal
Pump
Water control valve
canal
Evangeline
T9S-R5E
T10S-R5E
353

LAKE MARTIN
October 1989
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 5, 1989.

Fanwort (Cabomba caroliniana) was the dominant submersed aquatic plant found in the center of the lake, whereas coontail (Ceratophyllum demersum) predominated in the canals and along the tree line at the edge of the lake. There was some bladderwort (Utricularia sp.) mixed in with both of the above species.

There was an abundance of duckweed (Lemna minor) and watermeal (Wolffia sp.) present, especially where the submersed vegetation was topped out. Water hyacinth (Eichhornia crassipes) and frog's bit (Limnobia spongia) were present in moderate amounts, mostly in the woods.


Canal
water control Valve
Pump
Ruth Canal
Road to Levee
Parish Road (to Lm. 31)
Levee
Levee
T9S - R5E
T10S - R5E
T9S - R6E
T10S - R6E
353
Infestation Rate
- Severe
- Moderate
- Light
LAKE MARTIN
Scale: 1" = 1000'
Oct. 5, 1989

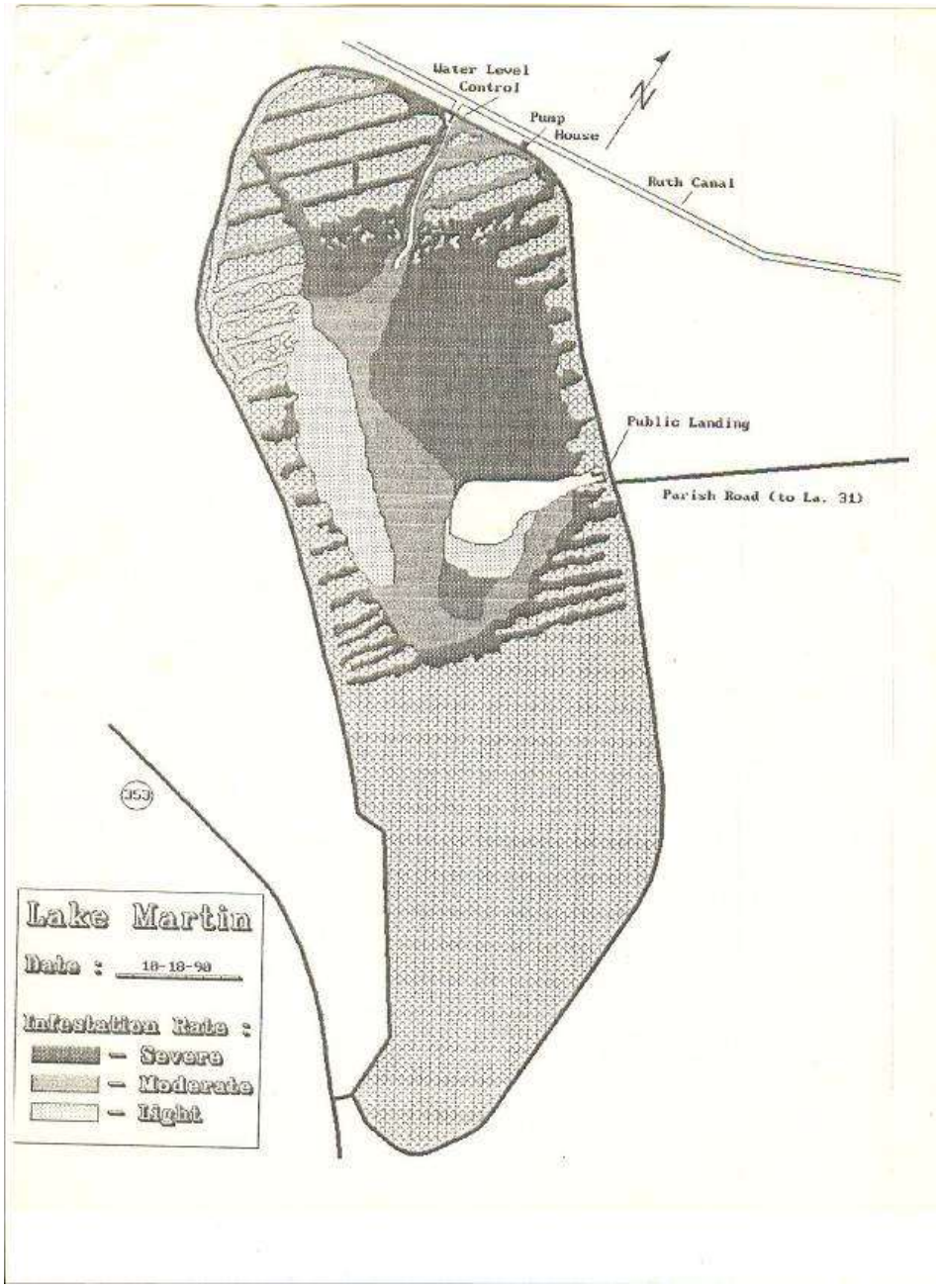
LAKE MARTIN
October 1990
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 18, 1990.

Fanwort, Cabomba caroliniana, was the predominant submersed vegetation found in the open water area of the lake. Approximately 60% of this area was heavily infested, while the rest was moderate to light. Along the tree-line, in the flooded woods and in the canals, coontail, Ceratophyllum demersum, predominated. There was very light infestations of bladderwort, Utricularia sp., in all areas.

There was an abundance of duckweed, Lemna minor, and watermeal, Wolffia sp., present, especially where submersed vegetation was topped out. Water hyacinth, Eichhornia crassipes, and frog's bit, Limnobia spongia, were present in moderate amounts.

The weather on the day of the survey was clear, cool and very windy (north at 15-20 mph). The water was clear to lightly turbid (secchi-3') and the temperature of the water was 68 degrees fahrenheit. The lake level was at 8.5 feet.


Water Level
Control
Pump
House
N
Bath Canal
Public Landing
Parish Road (to La. 31)
353
Lake Martin
Date : 10-18-90
Infestation Rate :
— Severe
— Moderate
— Light

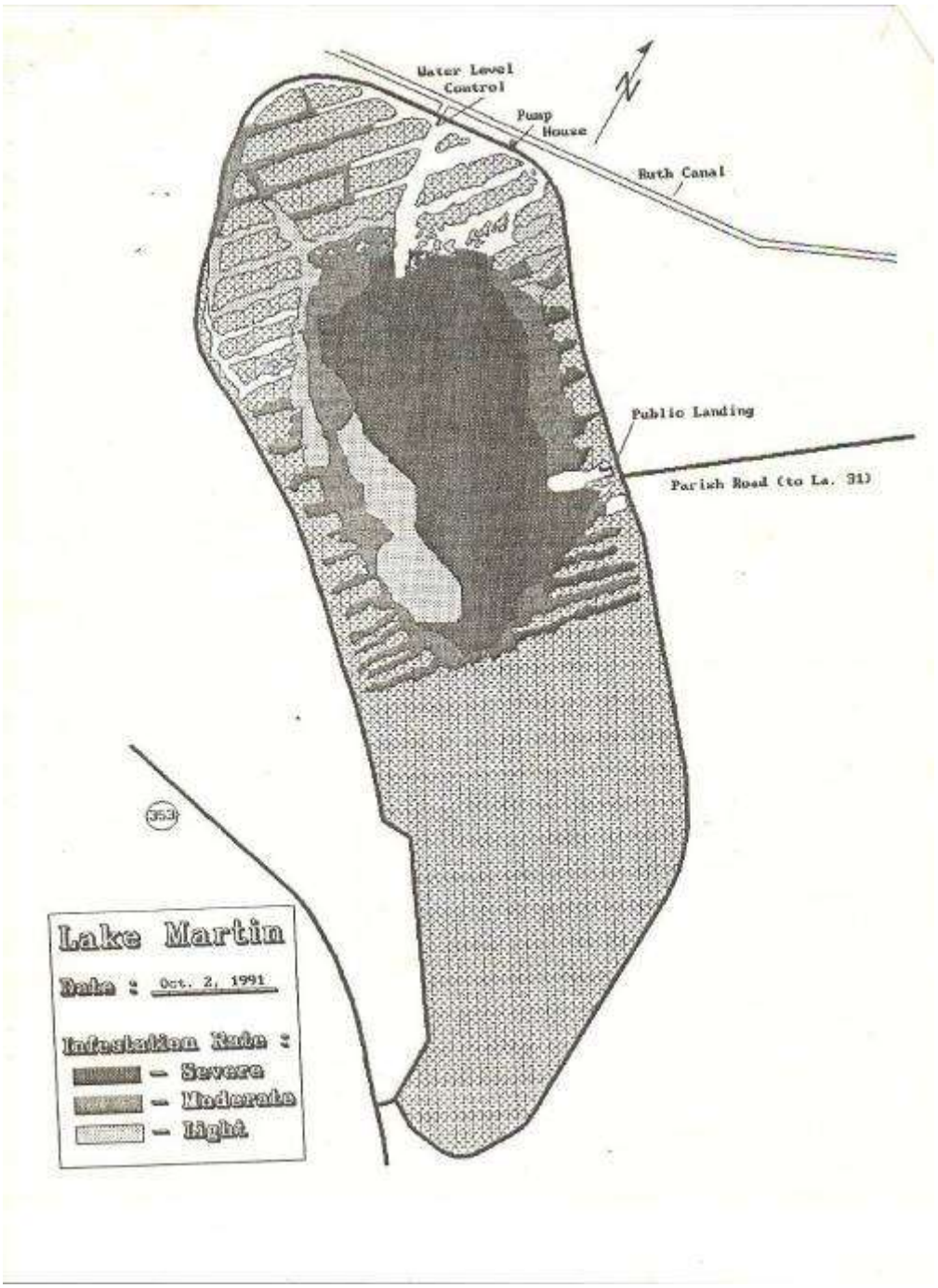
LAKE MARTIN
October 1991
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 2, 1991.

Fanwort, Cabomba caroliniana, was the predominant submersed vegetation found in the open water area of the lake. Approximately 80% of this area was heavily infested, while the rest was moderate to light. Along the tree-line, in the flooded woods and in the canals, coontail, Ceratophyllum demersum, predominated. There was also some coontail mixed with the moderate infestations of fanwort. Light infestations of bladderwort, Utricularia sp., were found in all areas.

There was an abundance of duckweed, Lemna minor, and watermeal,
Wolffia sp., present, especially where submersed vegetation was topped out. Water hyacinth, Eichhornia crassipes, and frog's bit, Limnobia spongia, were present in moderate amounts.

The weather on the day of the survey was clear to partly cloudy and warm (76 degees F). Wind speed was less than 5 miles per hour. The water was fairly clear (secchi-4') and the temperature of the water was 77 degrees F. The lake level was at 10 feet.


Water Level Control
Pump House
Ruth Canal
Public Landing
Parish Road (to La. 31)
353
Lake Martin
Date : Oct. 2, 1991
Infestation Rate :
– Severe
– Moderate
– Light

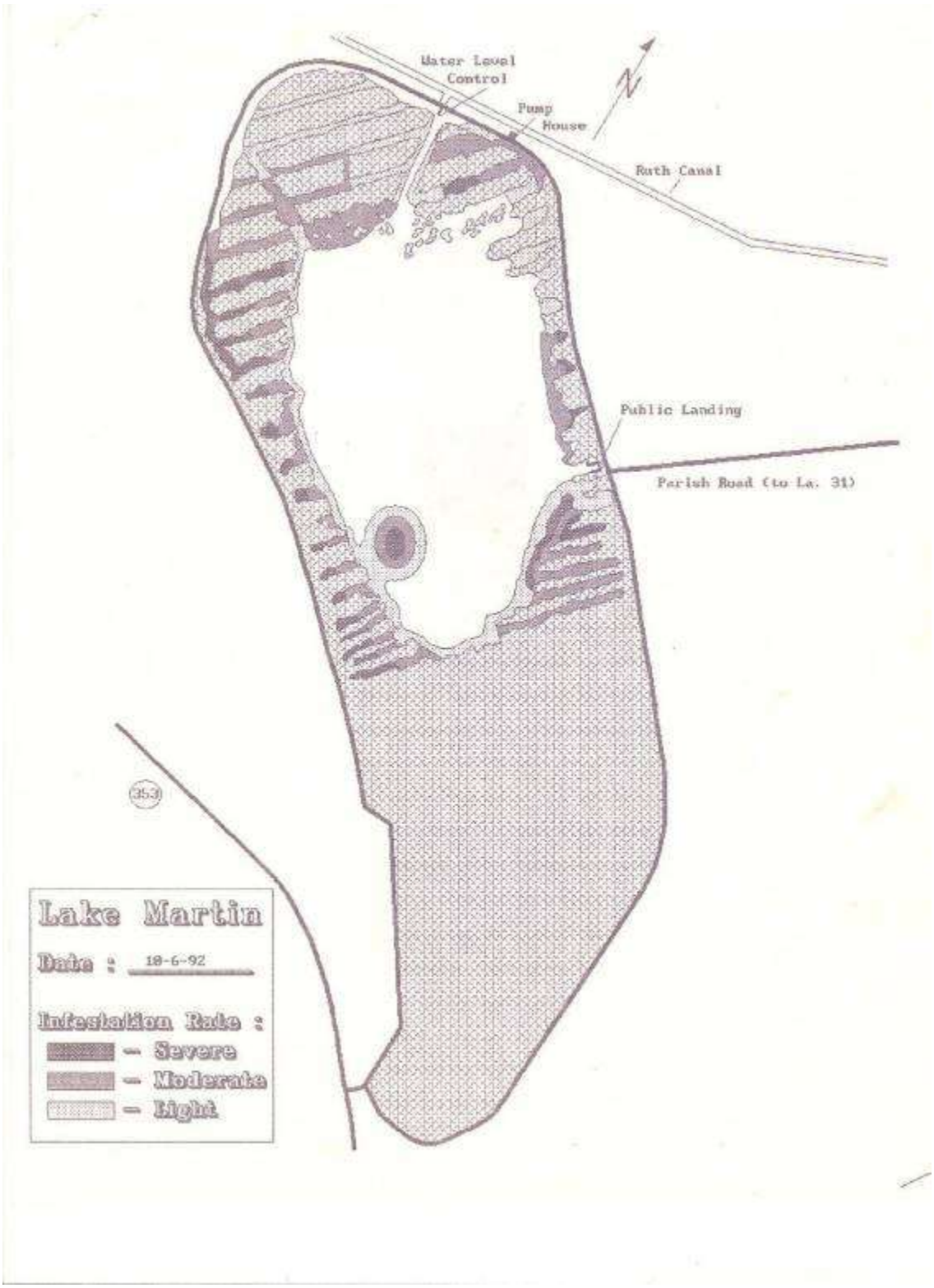
LAKE MARTIN
October 1992
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 6, 1992.

The occurrence of submersed vegetation was much less than in past years. The predominant plant was coontail, Ceratophyllum demersum. Fanwort, Cabomba caroliniana, the dominant plant in the past, was not observed. The infestation of coontail was severe in water four feet deep or less. This was mostly at the ends of the canals that cross the flooded woods. In most of the canals, in water four to five feet deep, the infestation was moderate to light. In the southern part of the open water area there was a small area of moderate to severe infestation.

There was an abundance of duckweed, Lemna minor, and watermeal, Wolffia sp., present in the canals and flooded woods. There was very little water hyacinth, Eichhornia crassipes, and frog's bit, Limnobium spongia, observed anywhere in the lake.

The weather on the day of the survey was clear and warm (82 degrees F). Wind speed was about 5 miles per hour. The water was clear (secchi- 4-5 feet) and the water temperature was 76 degrees F. The water level was at 10.2 feet.


Water Level Control
Pump House
Ruth Canal
Public Landing
Parish Road (to La. 31)
353
Lake Martin
Date : 10-6-92
Infestation Rate :
— Severe
— Moderate
— Light

700 acres +/-

LAKE MARTIN
October 1993
Charles N. Dugas

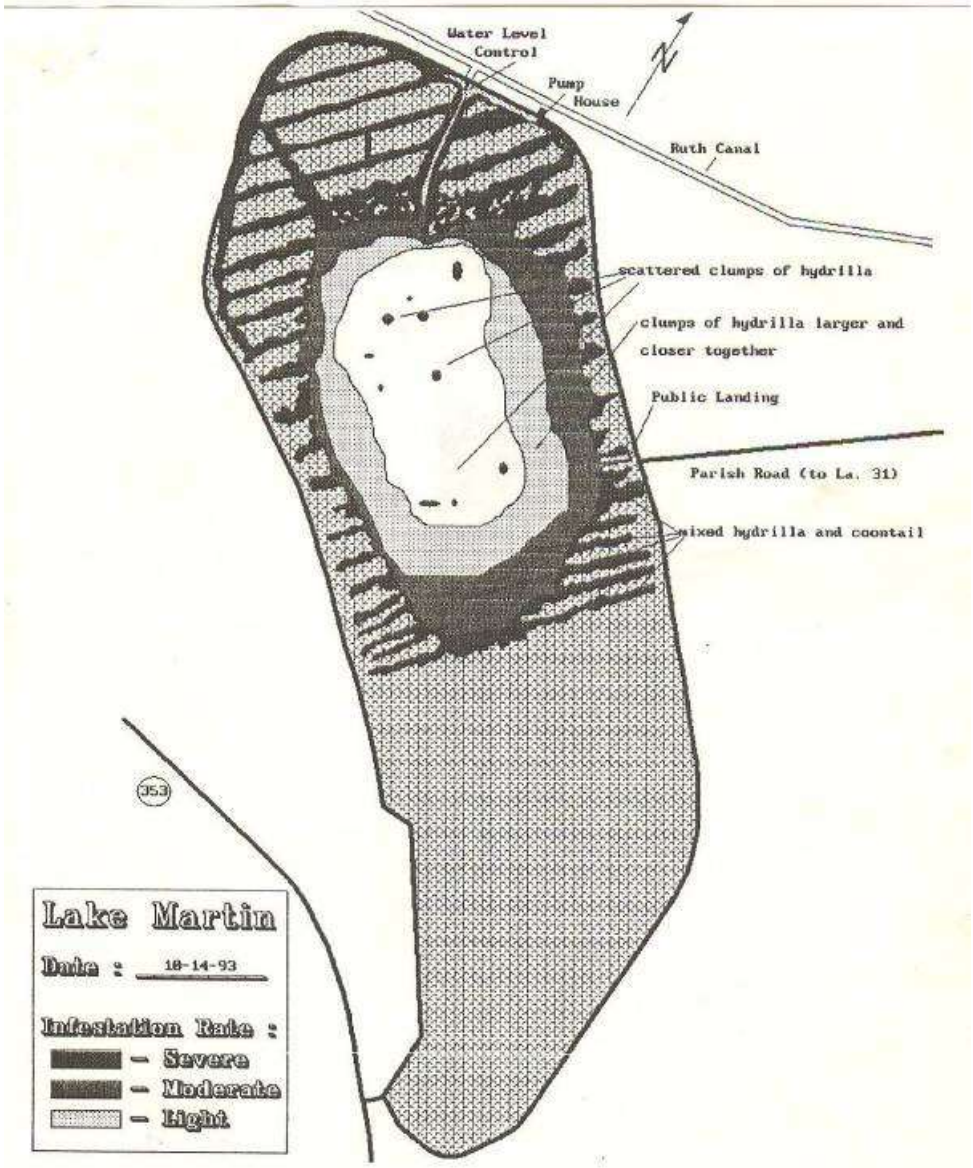
Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 14, 1993.

During this survey, the noxious aquatic weed, *Hydrilla verticilata*, was discovered in all parts of the lake. In water five feet or less it was mixed with coontail (*Ceratophyllum demersum*) and the infestation was severe. In water five to six feet deep along the flooded woods the infestation was moderate with the hydrilla being mixed with a lesser amount of coontail. There was a light infestation of hydrilla in water six to seven feet deep. At this water depth there was little or no coontail. The hydrilla at this depth was in scattered clumps four to five in diameter. In the central portion of the lake (about 7 1/2 feet) the hydrilla was in widely scattered clumps that were smaller in diameter.

Water hyacinth (*Eichhornia crassipes*), duckweed (*Lemna minor*) and fanwort (*Cabomba caroliniana*) were also found in the lake. The infestation of water hyacinth and duckweed was located in the flooded woods and was moderate to severe. Only traces of fanwort were found scattered about the lake.

The weather on the day of the survey was overcast and foggy. The water was moderately clear (secchi- 3 feet) and the water level was at 10.3 feet.

Nature Conservancy
LDWF Levee lease
Private estates


Water Level Control
Pump House
N
Ruth Canal
scattered clumps of hydrilla
clumps of hydrilla larger and closer together
Public Landing
Parish Road (to La. 31)
mixed hydrilla and coontail
353
Lake Martin
Date : 10-14-93
Infestation Rate :
- Severe
- Moderate
- Light

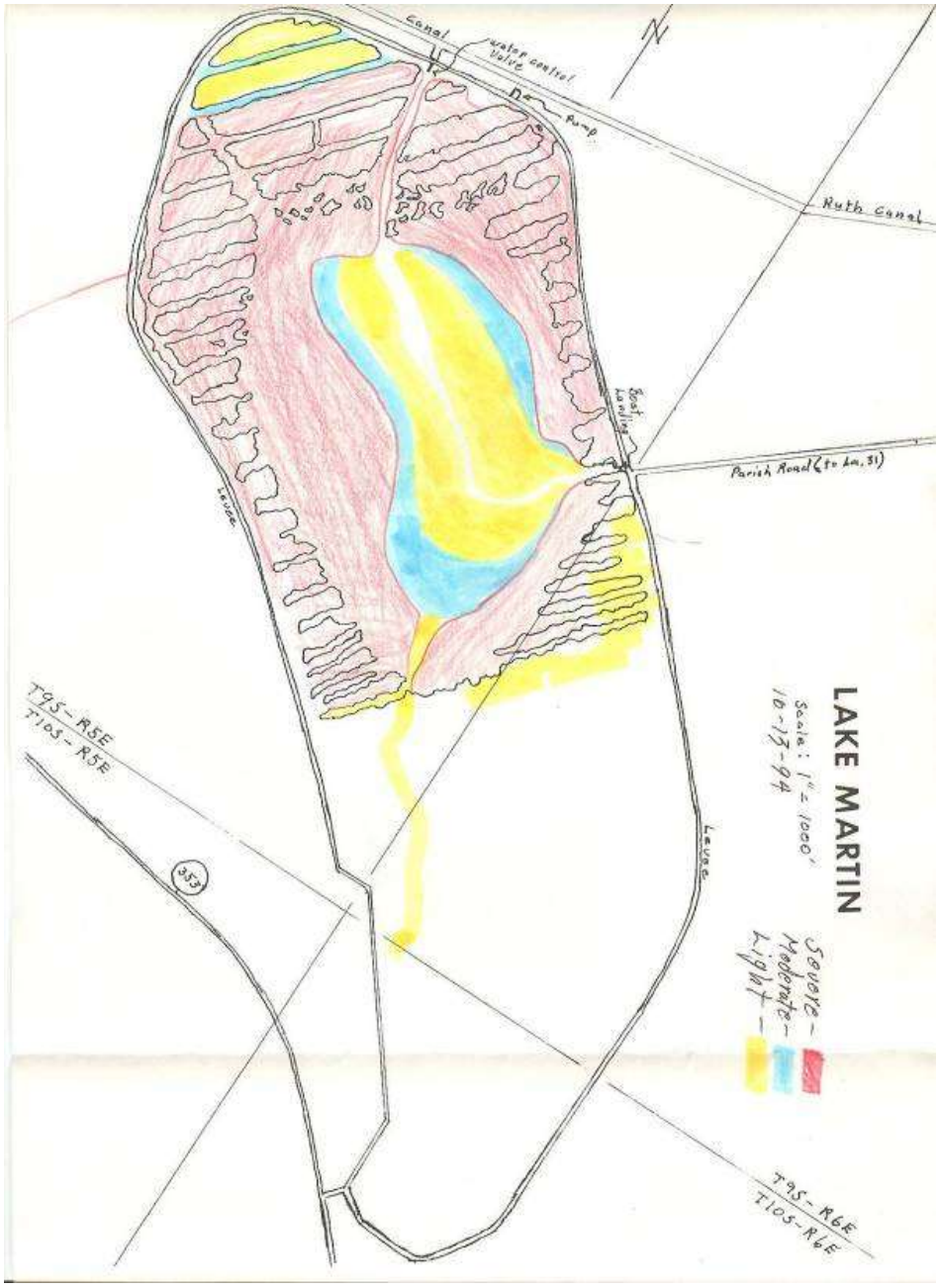
LAKE MARTIN
October, 1994
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 13, 1994.

During the survey hydrilla, *Hydrilla verticillata*, was found to have displaced most of the submerged native aquatic plants in the open water area of the lake. In water five feet deep or less the infestation was severe. In water five to six feet deep the infestation was moderate. The infestation of hydrilla in water six to seven feet deep was light. At this water depth there was some coontail, *Ceratophyllum demersum*. In the central portion of the lake there was a narrow channel free of vegetation. The incidence of hydrilla in the flooded woods had increased slightly since the previous year.

Coontail was found in some of the canals at the north end of the lake in severe infestations. Water hyacinth, *Eichhornia crassipes*, and duckweed, *Lemna minor*, were also found in the lake. The infestation of water hyacinth and duckweed was located in the flooded woods and was moderate to severe.

The water was very clear with a secchi of six feet.

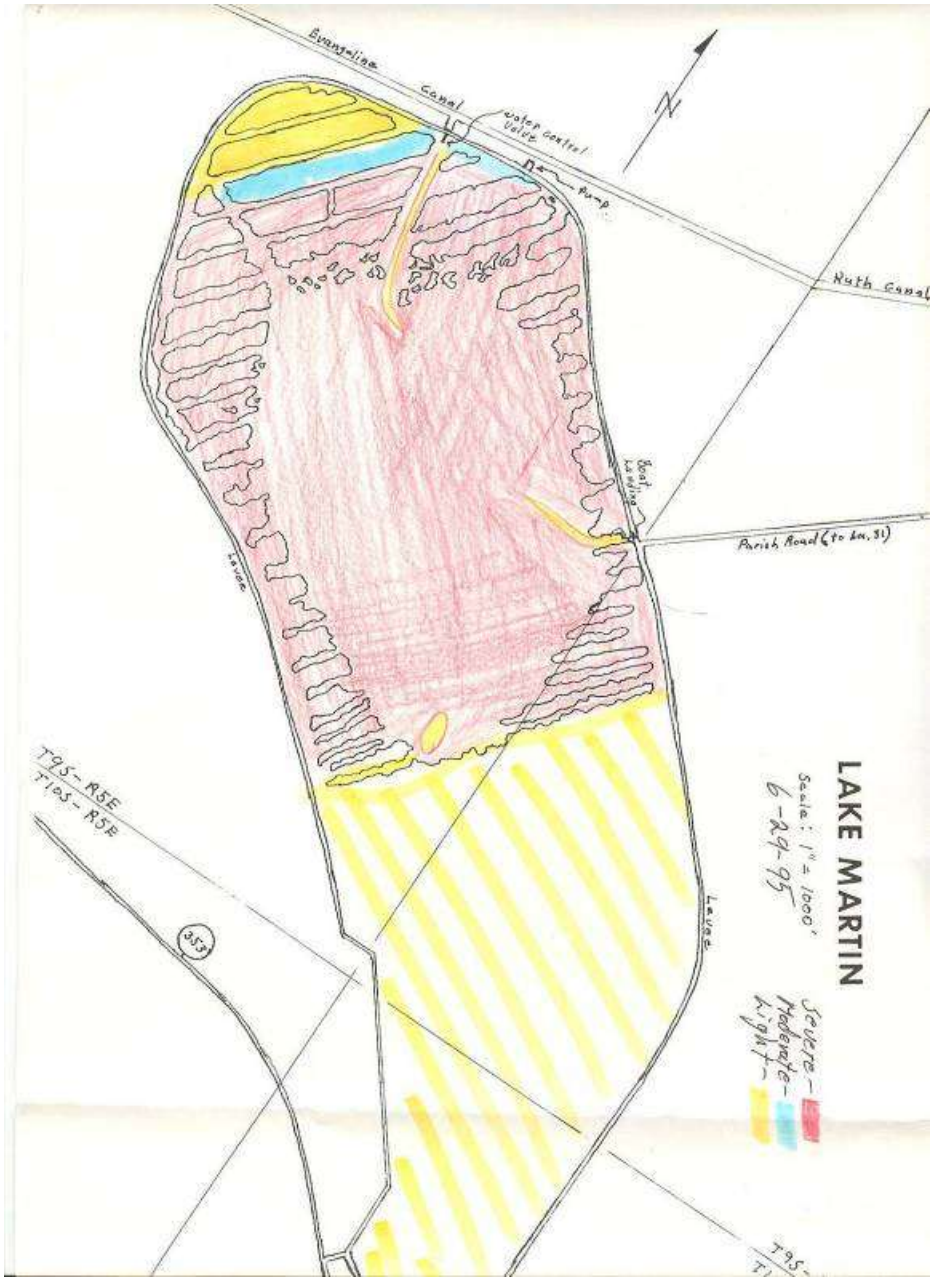

Canal
water control valve
Pump
Ruth Canal
East Landing
Parish Road (to Ln. 31)
Levee
T9S - R5E
T10S - R5E
353
Levee
T9S - R6E
T10S - R6E
LAKE MARTIN
Scale: 1" = 1000'
10-17-94
Severe -
Moderate -
Light -

LAKE MARTIN
June 29, 1995
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on June 29, 1995.

At the time of the survey there was probably less than 5% of the 200-acre open water portion of the lake that was not heavily infested with hydrilla, *Hydrilla verticillata*. The remainder of the lake (the flooded woods and some boat lanes on the north end of the lake) was lightly infested with submergent vegetation: mostly coontail, *Ceratophyllum demersum*, fanwort, *Cabomba caroliniana*, and some hydrilla. Duckweed, *Lemna minor*, and water-meal, *Wolffia sp.*, covered the entire surface of the lake.

The weather on the day of the survey was hot and clear. The water was extremely clear (secchi: >6 feet).


Evangeline
Canal
water control
Valve
Pump
Huth Canal
Boat
Launching
Parish Road (to Lk. St)
Levee
T9S - R5E
T10S - R5E
353
Levee
LAKE MARTIN
Scale: 1" = 1000'
6-29-95
Severe -
Moderate -
Light -

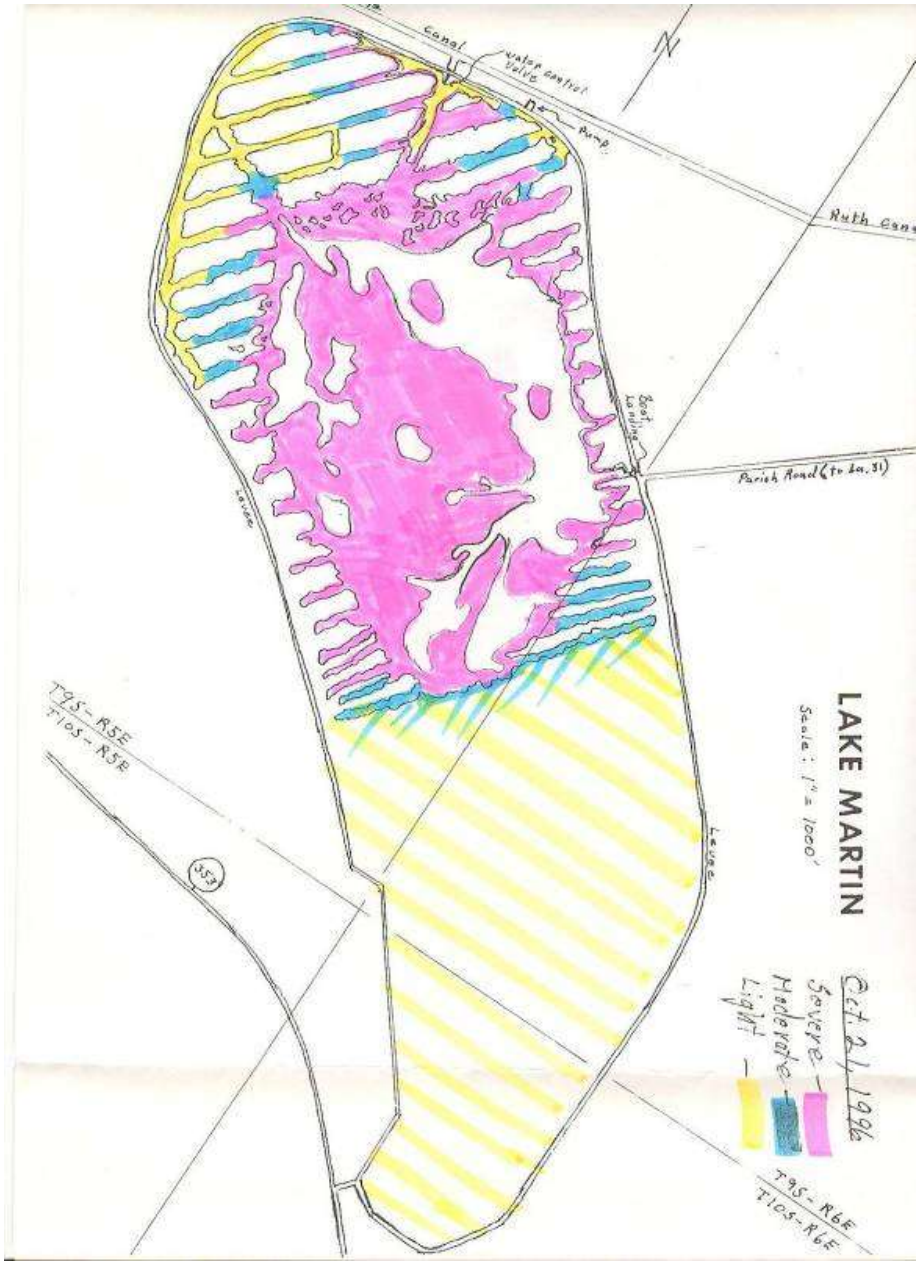
LAKE MARTIN
October, 1996
Charles N. Dugas

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on October 21, 1996.

As in the 1995 survey, hydrilla, Hydrilla verticillata, fwas still the predominant aquatic plant in the 200-acre open water portion of the lake. However, only about 75% of this area was infested as opposed to 95% in the previous year.

The remainder of the lake (the flooded woods and some boat lanes on the north end of the lake) was moderately infested with submergent vegetation: mostly coontail, Ceratophyllum demersum, fanwort, Cabomba caroliniana, and some hydrilla. Duckweed, Lemna minor, and water-meal, Wolffia sp., was present in the topped-out submersed vegetation.

The weather on the day of the survey was very windy, partly cloudy and cool. The water was moderately clear (secchi: <6 feet).


Canal
water control valve
Pump
Ruth Canal
Boat Landing
Parish Road (to La. 31)
Levee
T9S - R5E
T10S - R5E
353
LAKE MARTIN
Scale: 1" = 1000'
Oct. 24, 1996
Severe
Moderate
Light
T9S - R6E
T10S - R6E

LAKE MARTIN
August 2003
O. Scott Schales

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on August 6, 2003. On the day of the survey the water was fairly clear with secchi disk readings of 69 cm. According to the staff gauge located at the water control valve on the north end of the lake, the water level of the lake was at 10.2 feet MSL.

The open section of the lake was free of all aquatic vegetation. Heavy infestations of a mixture of duckweed (*Lemna minor*), water hyacinth (*Eichhornia crassipes*), and watermeal (*Wolffia spp.*) was observed in portions of the wooded areas surrounding the lake. Light to moderate amounts of common salvinia (*Salvinia minima*) were also present in these areas. Dense mats of these floating plants were more severe on the east side of the lake due to a prevailing west wind.

Moderate amounts of hydrilla (*Hydrilla verticillata*) were observed adjacent to the lake's levee road south of the boat landing. This was the only submersed vegetation located.

Moderate stands of sedges (*Carex spp.*) were observed growing in the dense mats of the floating plants in the wooded sections on the north end of the lake.

Other aquatic plants that were observed in trace to light amounts were pennywort (*Hydrocotyle spp.*), alligatorweed (*Alternanthera philoxeroides*), American lotus (*Nelumbo lutea*), water primrose (*Ludwigia spp.*), duck potato (*Sagittaria spp.*), flatsedge (*Cyperus virens*), cattail (*Typhae spp.*), needlegrass (*Juncus roemerianus*), and frogbit (*Limnobium spongia*).

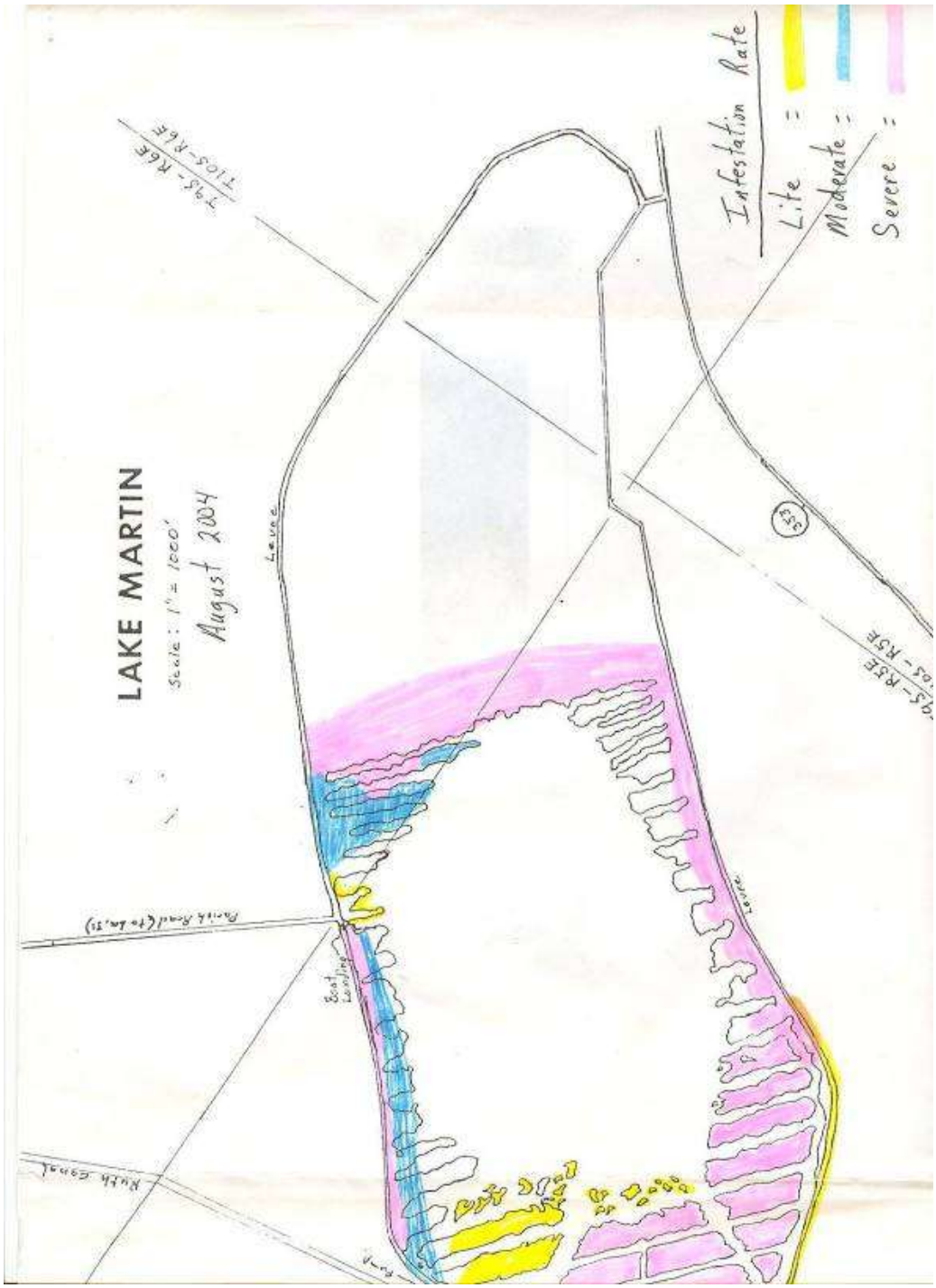

LAKE MARTIN
Ruth Canal
Parish Road (to Lm. 51)
T9S-R5E
T10S-R5E
T9S-R6E
T10S-R6E
Infestation Rate
Severe =
Moderate =

LAKE MARTIN
August 2004
O. Scott Schales

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on August 31, 2004. On the day of the survey the water was fairly clear with secchi disk readings of 64-66 cm. The water level of the lake was 9.8' MSL.

As in last year's survey, heavy infestations of duckweed (*Lemna minor*), water hyacinth (*Eichhornia crassipes*), and watermeal (*Wolffia spp.*) was observed in portions of the wooded areas surrounding the lake. Light amounts of these plants were observed floating through the middle of the lake due to a northeast wind. Moderate amounts of common salvinia (*Salvinia minima*) were also observed in various locations throughout the lake.

Other plants observed in trace to light amounts were alligatorweed (*Alternanthera philoxeroides*), water primrose (*Ludwigia spp.*), American Lotus (*Nelumbo lutea*), pennywort (*Hydrocotlye spp.*), duck potato (*Sagittaria spp.*), flatsedge (*Cyperus virens*), sedge (*Carex spp.*), cattail (*Typhae spp.*), giant cutgrass (*Zizaniopsis miliacea*), and needlegrass (*Juncus roemerianus*).

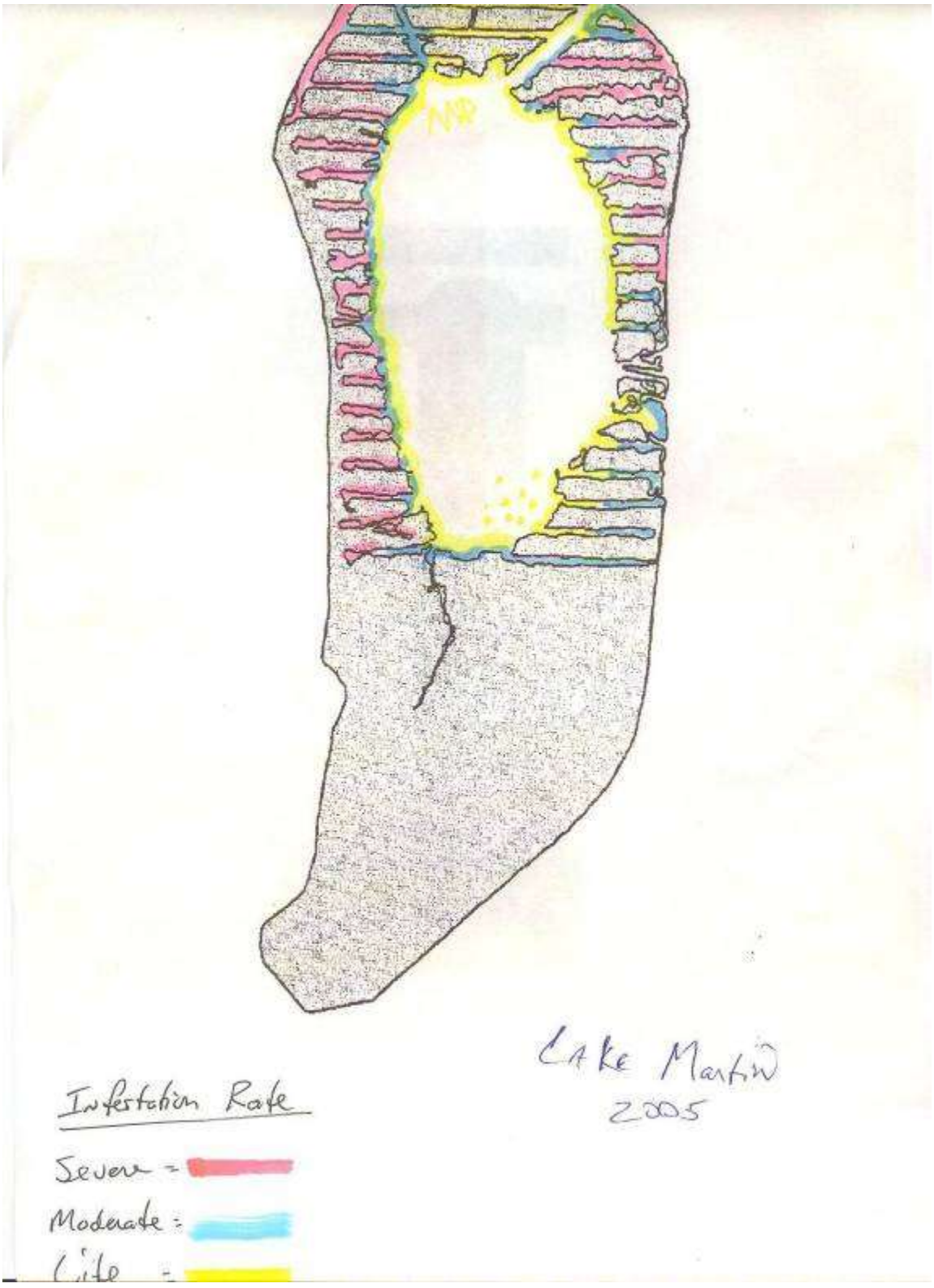

LAKE MARTIN
Scale: 1" = 1000'
August 2004
Infestation Rate
Light =
Moderate =
Severe =
Levee
Levee
Boat Landing
Park Area

Lake Martin
September 2005
Jody David

Lake Martin, St. Martin Parish, was surveyed for the presence of aquatic vegetation on September 13th, 2005. On the day of the survey the water was clear with secchi disk readings of 68 cm. The water level of the lake was 9.7 feet MSL.

The open section of the lake was free of all aquatic vegetation. Moderate to heavy infestations of duckweed (*Lemna minor),* watermeal (*Wolffia spp.)* and common salvinia (*Salvinia minima*) was observed in portions of the wooded areas surrounding the lake. Also light amounts of water hyacinth (*Eichhornia crassipes)* were located on the southwest end of the lake in and near the rookery. The only submerged vegetation, hydrilla (*Hydrilla verticillata),* was located near the boat ramp in less than one foot of water.

Other aquatic plants that were observed in trace to light amounts were pennywort (*Hydrocotyle spp.),* alligatorweed (*Alternanthera philoxeroides),* American lotus (*Nelumbo lutea),* water primrose (*Ludwigia spp.),* duck potato (*Sagittaria spp.),* sedge (*Carex spp.),* cattail (*Typha spp.),* needle grass (*Juncus roemerianus)* and frogbit (*Limnobium spongia).*


Lake Martin
2005
Infestation Rate
Severe =
Moderate =
Lite =